

MODELS 300S, 350SS, 500SST

MASSEY-FERGUSON

Ski Whiz



12.5 M - 7/69 W.A.
Printed in U.S.A.

IDENTIFICATION NUMBERS

The chassis identification plate is attached to the left side of the chassis, Fig. A, just behind the chain case. The engine identification plate is attached to the lower left side of the blower housing, Fig. B. Record these numbers in the spaces provided below and refer to them whenever requesting parts or service.

MACHINE MODEL NO.: _____

MACHINE SERIAL NO.: _____

ENGINE MODEL NO.: _____

ENGINE SERIAL NO.: _____



Fig. A. - Chassis Identification No.



Fig. B - Engine Identification No.

INTRODUCTION

MF Ski Whiz Snowmobiles are rugged, versatile machines, designed for winter work or play. They will operate efficiently in heavy or light snow, on level or hilly terrain and are exceptionally stable under widely varying conditions.

Three different models and three, 2 cycle engines are available: 300 S - (292cc) 18.5 hp*; 350 SS - (336 cc) 22 hp*; and 500 SST - (443.8 cc - twin cylinder) 29 hp*. Operating and maintenance instructions for all models are similar. Where differences do occur, they will be noted in this Manual.

During the first 20 hours, operation should be exactly as prescribed in this Manual. As soon as possible after the 20-hour break-in period, the Ski Whiz should be returned to the Massey-Ferguson Dealer where it was purchased for a check-up and servicing.

Genuine Massey-Ferguson Ski Whiz parts should always be used when repairing or servicing these machines.

READ THIS MANUAL CAREFULLY BEFORE OPERATING THE SKI WHIZ AND REFER TO IT REGULARLY IN REGARD TO OPERATION AND MAINTENANCE.

When directions, left or right are given, they are when at the rear, facing the front of the machine.

*Engine Manufacturer's Ratings at 5500 RPM.

OPERATION

BREAK-IN PERIOD (20 Hours)

Operate the Ski Whiz at approximately 4500 to 4800 rpm (1/2 to 3/4 throttle) under light to medium loads for the first 20 hours. The Ski Whiz should not be operated at full throttle at any time during the break-in period. After approximately 20 hours, return the Ski Whiz to the Massey-Ferguson Dealership where it was purchased for a service check and adjustments.

CONTROLS

Throttle Control

The throttle control is located on the right handle bar, Fig. 1. Pressing on the throttle control increases

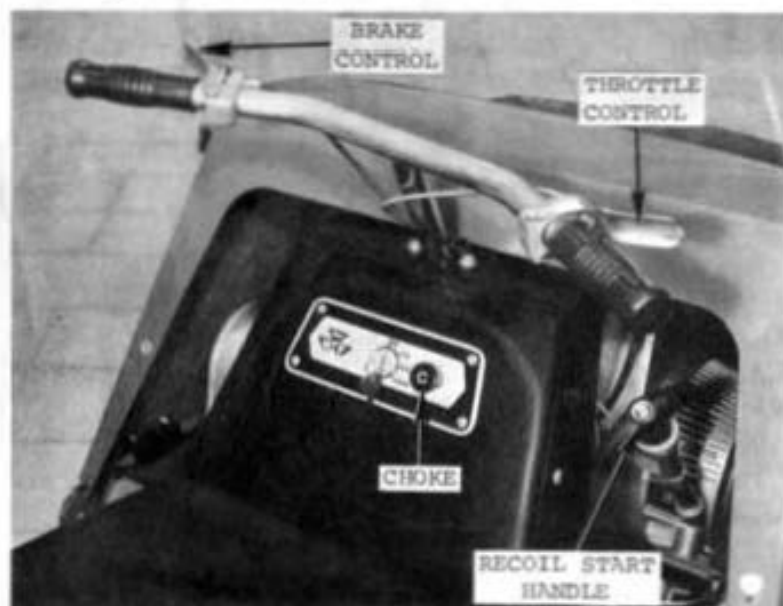


Fig. 1 - Controls

engine speed. Releasing the control decreases engine speed and causes the converter to shift into neutral, quickly stopping the machine.

Brake Control

The brake control is located on the left handle bar. Depressing the control engages the brake. When the control is released, the brake disengages.

NOTE: Throttle and brake controls are adjustable to suit individual preference. See the "Adjustments" section.

Ignition Switch

The ignition switch is a key-operated type, located in the center of the instrument panel. It has four positions; "off", "lights", "on" and "start". The key must be turned to the "on" position to start the engine. Turning to the "off" position shuts off the engine. After the engine is running, the key should be turned to the "lights" position if lights are required.

Choke

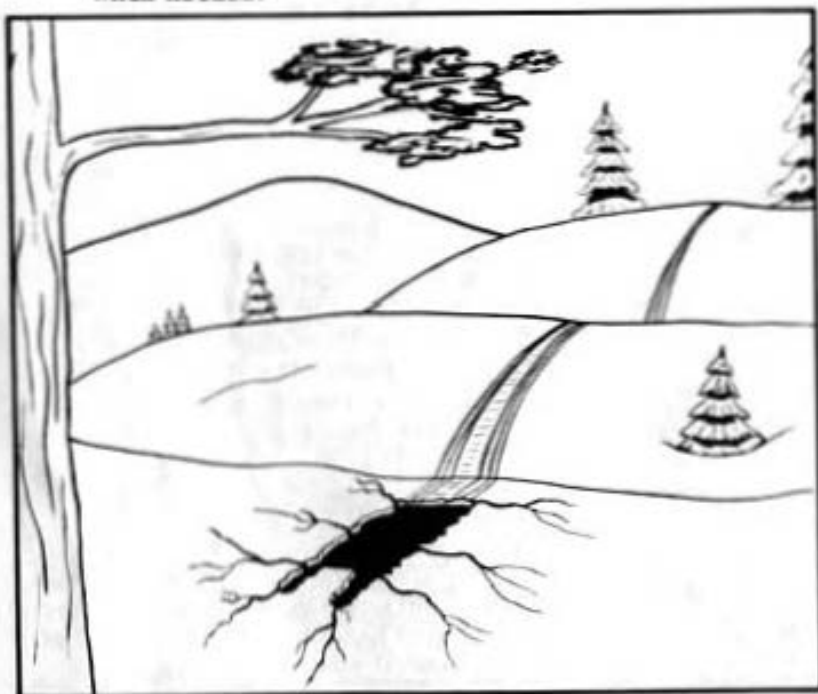
The choke control is located on the right side of the instrument panel. When starting on cold days, or after the Ski Whiz has been stopped for a reasonable period of time, the choke should be used to make starting easier. Refer to the section on "Starting".

Recoil Start Handle

The recoil start handle is located just to the right of the instrument panel. Pulling out on the handle turns the engine. Never release the handle and allow it to fly back. Hold the handle and allow the cable to gradually

rewind. If the battery is inactive on a machine equipped with electric start (accessory), the manual start may be used without interference.

NOTE: If the cable or rewind spring becomes broken or fouled, an emergency starting pulley may be used. Remove the blower housing and wind a rope around the pulley, pulling sharply on the rope to turn the engine. The cable or spring should be repaired or replaced as soon as possible, using the emergency system only when needed.



Think Twice When Near Thin Ice.



SAFETY SUGGESTIONS



The Ski Whiz was designed with safety in mind. However, since it is a high-speed vehicle, care and common sense should be used in its operation.

Before operating the Ski Whiz at high speed, become thoroughly familiar with its controls and handling characteristics. Special attention should be given to steering, as it differs sharply from that of wheeled vehicles.

- Never accelerate quickly with persons close behind the machine. The drive track may throw rocks or ice particles which could cause injury. Do not attempt sharp turns at high speeds when on light snow or ice.
- Operate with care in wooded areas, avoiding large rocks, closely spaced trees, low hanging limbs or sharp drop-offs.
- Be suspicious of deep drifts. They could hide a cliff edge or other traps for the unwary.
- Operate cautiously on glare ice or other slick surfaces until familiar with machine handling.
- Always keep both hands on the steering handles whenever the Ski Whiz is in motion.
- Never touch cold metal with bare skin. Much of the Ski Whiz covering is made of fiber glass, but warm hands can stick to cold metal parts, causing painful injury.
- Trailing feet can cause leg injuries. Keep feet on running boards at all times.
- For maximum safety, a helmet is recommended.

- Never work on the Ski Whiz when the engine is running, except during carburetor adjustment.
- Due to glare from snow, vision may be impaired temporarily. Operate cautiously until accustomed to bright sun.

FUEL

The Ski Whiz must never be operated on plain gasoline. A mixture of regular gasoline and SAE 40 two-cycle engine oil must be used. The gasoline and oil must be well mixed when reasonably warm (at least 50° F.) so that the mixture will not separate when left standing for long periods of time.

Mix the gasoline and two-cycle engine oil at a ratio of 20 parts gasoline to one oil, or five gallons of gasoline to one quart oil, thoroughly mixed. If additional gasoline or oil is added to previously mixed fuel, the 20 to one ratio must always be maintained and fuels must be thoroughly mixed. Use of fuels which are not mixed thoroughly at proper ratio can quickly ruin an engine.

Use any of the following oils, or their equivalent:
MF Two-Cycle Engine Oil - Part No. 841 614 M1
(U.S. qt.)

(Available from Massey-Ferguson Dealers)
Part No. 841 615 M1 (Imp. qt.)

American Oil Co. - New American Outboard Motor Oil

Empak Industries, Omaha, Nebraska - Tech Lube Cycle Oil

Westland Oil Co., Minot, N. Dak. - Itasca 2 Cycle Motor Oil, Suffix P

IMPORTANT: Running the Ski Whiz when it is low on fuel may cause serious engine damage. Should engine operation become erratic, shut off engine and determine if low fuel supply is the cause. If it is, fill tank before resuming operation.

STARTING

Whenever the machine is stored outside, make certain the track is not frozen to the ground before attempting to start the engine. See Fig. 2. Before starting, tilt the machine sharply to make certain the entire track is broken free. To start the engine, proceed as follows:

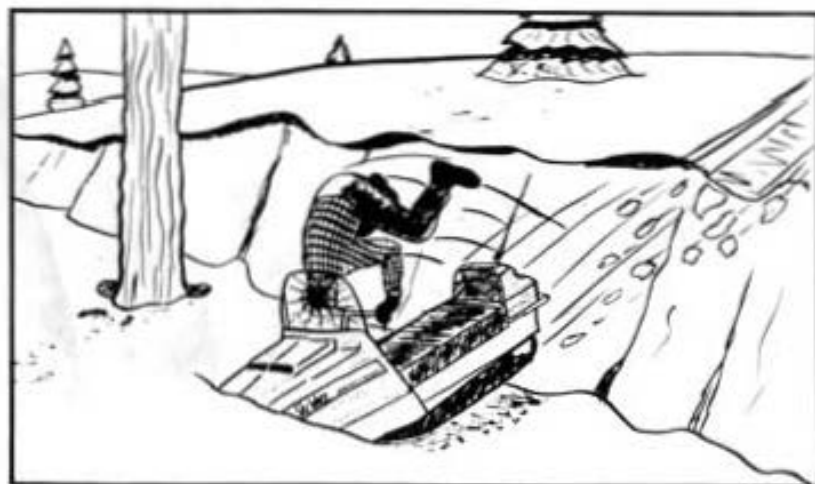


Fig. 2 - Breaking Machine Loose from Ice



CAUTION: Release the throttle quickly after engine starts. If engine speed is too high, the machine will move when the engine starts.

1. Turn the key to the "start" position.
2. Pull choke out approximately half way.
3. Squeeze throttle control slightly (approximately 1/4 open).
4. Pull gradually on the starter handle until resistance is felt, then pull sharply to turn the engine. Hold on to the starter handle and allow the cable to rewind slowly. After first pull, set choke half way then pull starter handle.
5. As soon as the engine starts, release the throttle control and allow the engine to idle until it warms up.
6. Adjust the choke as needed and operate at moderate speed until the engine reaches normal operating temperature.



Careless Travel Can Make You Unravel!

ADJUSTMENTS

Although all components of the Ski Whiz are carefully assembled and adjusted at the factory, and checked and pre-delivered by the Massey-Ferguson Dealer, adjustment will eventually be required, due to wear. Due to differences in operator's techniques and uses to which the machine may be put, no specific recommendations as to operating periods are made before such adjustments are to be checked.

Drive Chain Tension

Remove the drive chain cover on the left side of the machine, and check chain tension. If the chain is not taut, tighten as follows: Loosen two bolts on the right and two at the right rear of the bearing block. Push up on the drive shaft, inside the chain case, until the chain is taut. Maintain chain tightness and retighten all four bolts. Replace cover securely after adjusting chain. See Fig. 3.

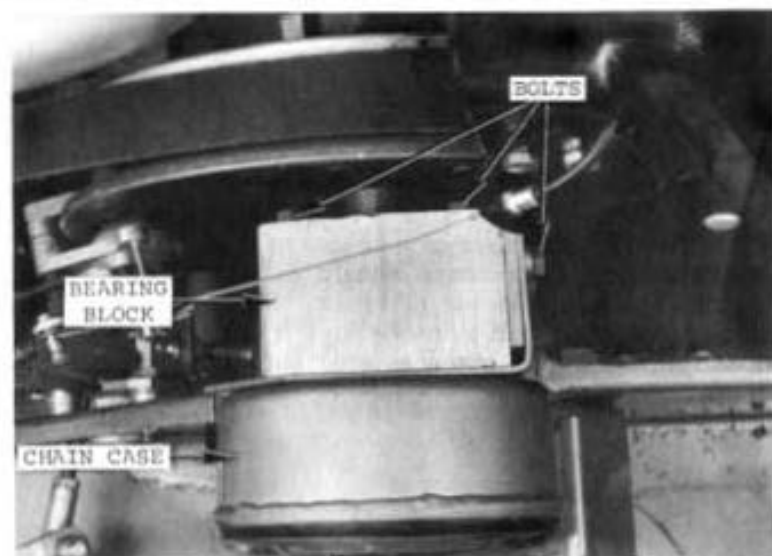


Fig. 3 - Chain Tension Adjustment



Fig. 4 - Track Tension Adjustment

Track Tension

The track should be tight enough so that it maintains its proper position when in operation. All parts of the track, under the bogey wheels, must be in contact with the ground. After tightening the track until it is taut, check to make sure it contacts the ground under all bogeys. Raise rear of machine to check track. Approximately 1" clearance should exist between center bogey wheels and inside of track. Measure the thread of each adjusting bolt to make sure it is adjusted equally on each side. Tighten locking nuts after adjustment is made. See Fig. 4.

Ski Alignment

The skis should be parallel on each other, or toed in slightly. Measure the distance between skis at the front and rear edges. If the measurements are not the same,

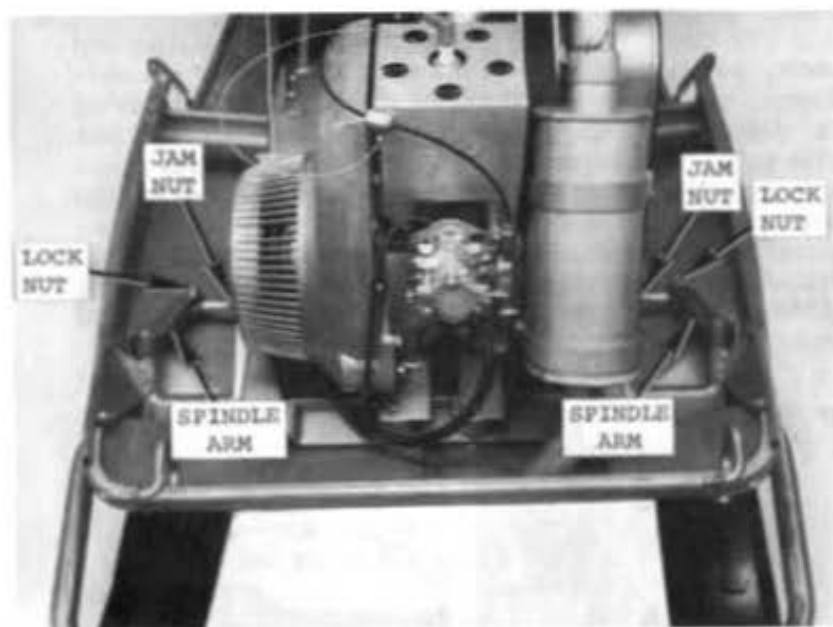


Fig. 5 - Ski Alignment

loosen the locknut and turn the tie rod in or out. Repeat at other ski, adjusting both skis so that the tie rod length is the same on each side. After adjustment is complete, make sure locknuts are securely tightened. See Fig. 5.

Weight Distribution

The Ski Whiz has an exclusive weight distribution system. It is adjustable at two points: ski saddles, in the front; and at the rear suspension arms. This adjustment permits changing handling characteristics to meet widely varying snow conditions.

At one end of the adjustment range, handling is excellent on hard packed snow and at the other end of the range, operation is superior in deep, soft snow. Intermediate positions improve handling under conditions between these two extremes. See Fig. 6 and 7.

For maximum maneuverability in hard packed snow, position the skis in the rear holes of the ski saddles. Depress the front of the machine when removing the skis to take the pressure off the saddles. After the skis have been repositioned, make sure the cotter pins are again spread. Loosen the jam nuts and back off the bolts on the rear suspension to allow the rear of the machine to rise. Through such adjustment, most of the machine and operator weight rests on the skis and rear of the track, permitting improved handling at high speed on hard snow.



Fig. 6 - Weight Distribution - Track



Fig. 7 - Weight Distribution - Skis

For better handling on soft or deep snow, position skis at the front holes and screw in the rear suspension bolts. This provides more uniform weight distribution for good speed, improved handling and superior hill climbing in deep snow.

After a reasonable amount of experience driving the Ski Whiz and making these adjustments, operators will easily find the most suitable adjustments to match their driving techniques under a variety of snow conditions.

Throttle and Brake Controls

The Ski Whiz is equipped with adjustable throttle and brake control levers, Fig. 8. To change the position of the levers, loosen the socket head setscrews in the lever pivot blocks. The levers may be moved in or out or turned to meet individual requirements. Care should be taken to make sure the cables are not twisted enough to cause the controls to bind.

The Ski Whiz is delivered with the control levers toward the rear, for thumb operation. If turned forward, they are positioned for finger control.

NOTE: Before operating, check throttle cable and control for freedom of movement. Should throttle stick, make sure control lever moves freely and cable is not binding due to twisting.



CAUTION: Inexperienced operators may have a tendency to grasp the throttle control when facing a dangerous situation. Due to this normal reaction, it is wiser to position the throttle control for thumb operation until thoroughly experienced with the operating characteristics of the Ski Whiz.



Fig. 8 - Throttle and Brake Control Adjustment

LUBRICATION AND MAINTENANCE

LUBRICATION

The Ski Whiz was designed for minimum maintenance, however, lubrication is occasionally required. Lubricate at the following locations and at the intervals stated. See Diagram, Fig. 9.

Take care to keep oils and greases from belts and track. Always wipe off oils or grease if accidentally spilled. Do not overlubricate at any point.

Wear Plates (No. 1) - Every 30 hours operation. Grease liberally with general purpose, lithium base grease.

Spring Pivots (No. 2) - Every 30 hours operation. Oil with SAE 5W-20 or 10W-30 motor oil.

Steering Spindles (No. 3) - When needed. Oil occasionally with SAE 5W-20 or 10W-30 motor oil.

Steering Shaft - Bottom (No. 4) - When needed. Oil occasionally with SAE 5W-20 or 10W-30 motor oil.

Spring Spacers (No. 5) - Every 30 hours. Oil liberally with SAE 5W-20 or 10W-30 motor oil.

Brake Pivot Points (No. 6) - When needed. Grease with general purpose, lithium base grease.

Steering Shaft - Top (No. 7) - When needed. Oil liberally with SAE 5W-20 or 10W-30 motor oil.

Chain Case (No. 8) - Change oil after first 15 hours operation -- thereafter add oil when needed.

Keep chain covered at bottom of case with approximately 1" SAE 80 transmission oil. When changing after break-in, 4-1/2 ozs. will fill case to proper level.

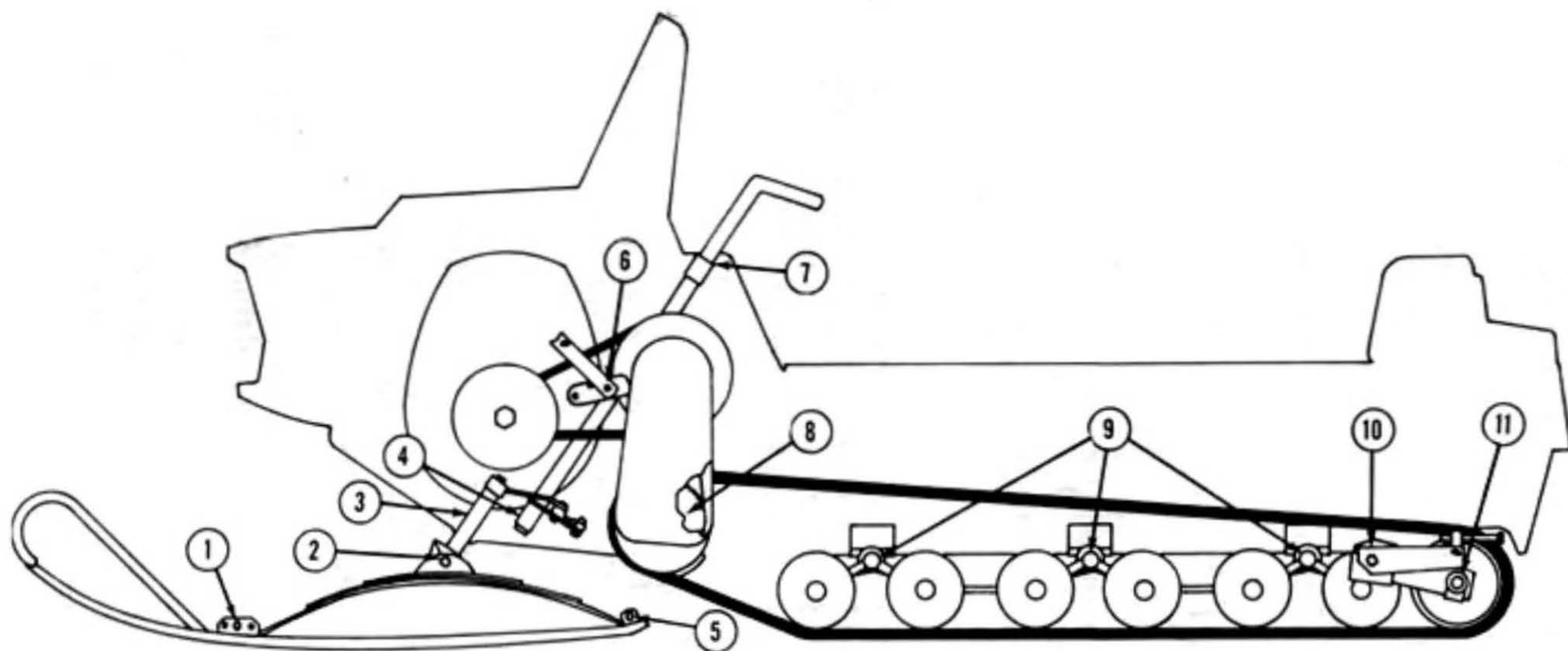


Fig. 9 - Lubrication Diagram

Suspension Springs (No. 9) - Every 30 hours. Grease liberally with general purpose, lithium base grease.

Pivot Assemblies (No. 10) - Annually. Oil liberally with SAE 5W-20 or 10W-30 Motor oil.

Idler Shaft (No. 11) - Annually. Grease liberally with general purpose, lithium base grease.

MAINTENANCE

Carburetor Adjustment

The carburetor is adjusted at the factory and should not be readjusted unless performance is exceptionally poor or erratic. See Fig. 10

Both high speed and idle mixture screws are turned clockwise to close, or lean the mixture; and counterclockwise to open, or enrich the mixture. To adjust the carburetor, proceed as follows:



CAUTION: Never attempt to adjust the Ski Whiz when it is moving.

1. Turn the high speed and idle mixture screws clockwise until fully closed, then open by turning counterclockwise 1-1/4 turns on idle mixture screw and 1-1/2 turns on high speed screw.

IMPORTANT: Do not turn adjusting screws in tight as seats may become damaged.

2. Block up the rear of the Ski Whiz so that the track is free of the ground. Start engine and allow to run at idle speed until normal operating temperatures are reached. Never race a cold engine.

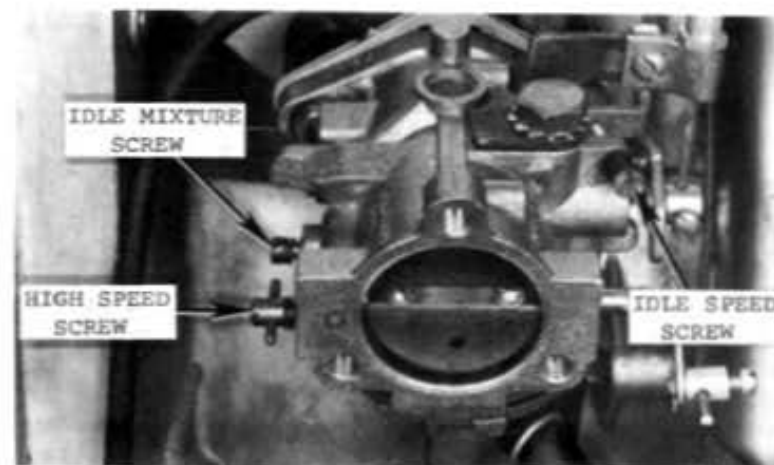


Fig. 10 - Carburetor Adjustment



CAUTION: If adjustment is made indoors, attach a tube to the exhaust pipe so that fumes will be emitted outside. Carbon monoxide is deadly.

3. Adjust the idle mixture screw 1/8 turn at a time until a smooth steady idle is achieved.

4. Adjust the idle speed screw until the engine is operating at from 1900 to 2000 rpm.

5. Readjust the idle mixture screw at this speed until the engine again runs smoothly.

After the carburetor has been adjusted, shut off the engine, then attempt to restart. It should start easily and run smoothly, if the carburetor adjustments have been correctly made.

6. Adjust high speed screw to provide best performance for climatic conditions and type of operation desired.

IMPORTANT: DO NOT ADJUST CARBURETOR

EXCEPTIONALLY LEAN, SINCE ENGINE DAMAGE CAN RESULT. A SLIGHTLY RICH MIXTURE IS PREFERABLE FOR PROLONGED ENGINE LIFE AND VARYING OPERATING CONDITIONS.

Spark Plug Replacement

Should carburetor adjustment fail to produce a smooth running engine, the cause may be fouled or burned spark plug. Periodically clean and check the spark plug, (2 plugs on Model 500 SST), resetting its point gap from .016 inch to .019 inch. When replacing the spark plug, make certain the washer is in place, and tighten to 26 to 30 ft.-lbs. torque.

When replacing plugs, use the following: All Models - Champion - K9, UK 180, or Bosch - M240T1.



Fig. 11 - Spark Plug



Bad Bumps Can Give You Lumps!

Cylinder Head Bolt Tightness

After the first 20 hours of operation, the head bolts must be checked for proper tightness. If loose, tighten to 18-21 ft.-lbs. torque. Tighten each a little at a time, in the order shown in Fig. 12. Head bolts are equipped with two nuts, with a washer in between.

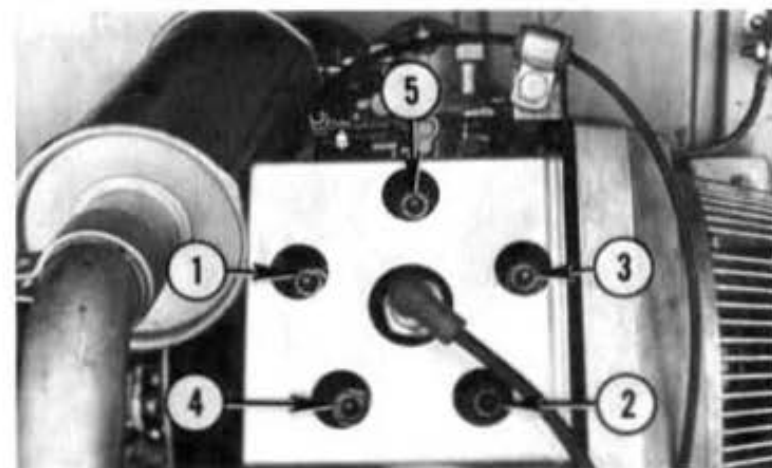


Fig. 12 - Tightening Head Bolts

IMPORTANT: Overtightening head bolts can strip treads or damage cylinder head.

The heat shield must be removed to tighten nuts. Most engine nuts and bolts are of metric, rather than fractional sizes.

IMPORTANT: Periodically check head bolts, especially after prolonged operation at high speeds.

Ignition Timing

Should the engine fail to perform satisfactorily and other adjustments or maintenance do not cause improvement, take the Ski Whiz to a Massey-Ferguson Dealer to have ignition timing checked and adjusted.

Brake Linkage Adjustment

Adjust castellated nut so that brake pads firmly grasp pulley when brake is fully engaged and just barely clear (.002 to .010 inch) the pulley when released. See Fig. 13. Replace cotter pin after adjusting.

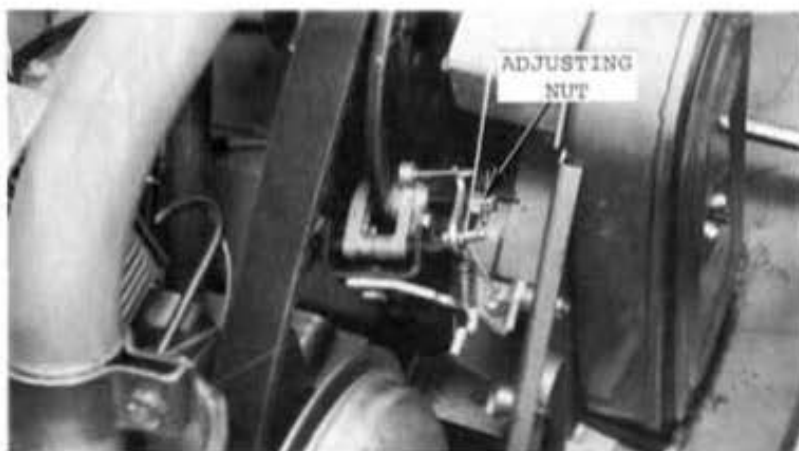
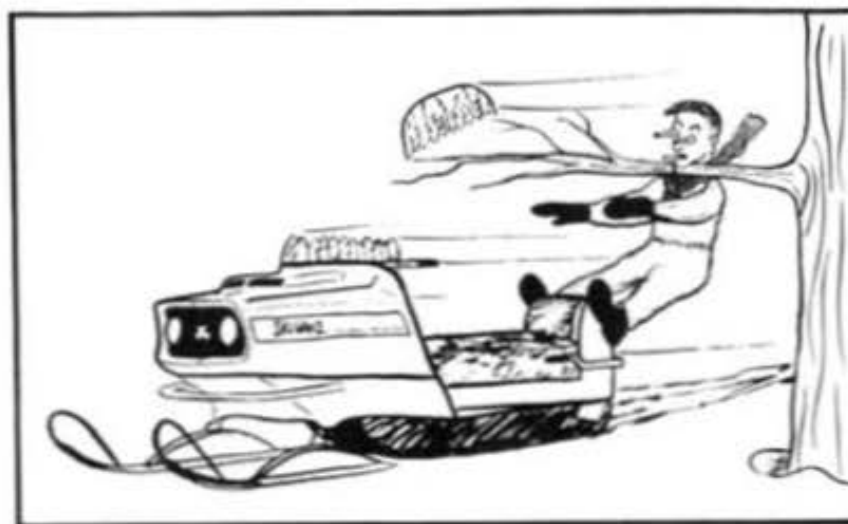


Fig. 13 - Brake Adjustment



Things Go Awry when You Fly Too High!

Drive Chain Replacement

The drive chain is equipped with a master link, Fig. 14, for easy removal and replacement of the chain. Remove all tension by backing off the adjusting bolt and removing master link. When replacing, make sure master link is toward outside of case.



Fig. 14 - Drive Chain Replacement

Ski Runner Replacement

When runners are worn badly, they may be replaced by removing nut on top of skis and sliding out runners from bottom. See Fig. 15.



Fig. 15 - Ski Runner Replacement

Drive Belt Replacement

To remove an old belt, roll belt off driven pulley and work around clutch pulley. The clutch or drive pulley is attached to the engine crankshaft. See Fig. 16.

To replace the belt, work the belt onto the clutch pulley first, then the driven pulley.



Fig. 16 - Drive Belt Replacement

TOOL BOX (350 SS, 500 SST)

The tool box is located at the back of the seat, Fig. 17. To open, unsnap fastener and lift up.



Fig. 17 - Tool Box

SUMMER STORAGE

Block vehicle off ground, taking weight off drive belt and skis.

Drain and clean fuel tank.

Loosen drive track and drive chain tension.

Oil skis on top and bottom with motor oil.

Remove spark plug, or plugs, place a few drops of SAE 30 motor oil in cylinder, or cylinders, and turn over engine, one or two complete revolutions, by hand. Replace spark plug, but leave wire disconnected.

Store Ski Whiz in protected area. If Ski Whiz must be stored outside, protective cover should be used.

TAKING OUT OF STORAGE

Lubricate all points as described in "Lubrication" section.

Flush out fuel tank, clean, then fill with fresh fuel of the proper oil -- gasoline (regular grade) mixture.

Check plug gap and replace spark plug, tightening to 26 to 40 ft.-lbs. torque. Connect plug wire.

Adjust tension of drive track and drive chain.

Run engine until thoroughly warmed, at low speed, then adjust carburetor if needed.

ACCESSORIES AND ATTACHMENTS

WINTER AND PROTECTIVE CLOTHING

Ski Whiz Suits

Lightweight, water and windproof suits are available in one or two-piece types. Jump suits are available in red and Rallaye suits in black. Two-piece suits have red jackets and black pants. All suits have detachable hoods. One Ski Whiz patch is sewn over the left breast pocket. Additional patches are available from Massey-Ferguson Dealers. See Figs. 18, 19, and 20.



Fig. 18 - One-Piece Suit and Helmet



Fig. 19 - Rallaye Suit

Mittens and Boots

Nylon mittens are pile lined for warmth. They have leather palms, zippers and elastic cuffs. Boots are made of nylon and rubber, and are equipped with zippers, drawstrings and straps. The felt liners are replaceable.



Fig. 20 - Winter Boot and Liner

Helmet, Visor and Goggles

The full, jet-style helmet (Z 90.1 - 1966 USASI approved) has an acetate rayon foam padded liner and molded rubber on edge for warmth and protection. Optional chin cup, detachable visor, or goggles with interchangeable lenses are also available.



Fig. 21 - Transport Trailer and Protective Cover

PROTECTIVE COVER

A heavy vinyl cover is tailored to fit the shape of the Ski Whiz, for use when storing outside or when in transport. Top vents allow cooling of engine without collecting moisture and prevent billowing of cover when traveling. The cover is equipped with drawstrings for easy installation or removal. See Fig. 21.

TRANSPORT TRAILERS — DOUBLE OR SINGLE

Either trailer may be towed at highway speeds and is equipped to meet highway regulations of most areas. Check with local officials regarding use. The trailers tilt in either direction for easy loading and unloading. A swivel hitch permits turning the trailer to the side, allowing loading and unloading without unhitching from the towing vehicle. Metal cleats are furnished to pre-

vent slippage. Nylon web tie-downs are optional. Break-away chains for the towing vehicle, taillights with stop and turn signals and license plate brackets are standard. See Figs. 22 and 23.



Fig. 22 - Loading on Double Trailer



Fig. 23 - Unloading

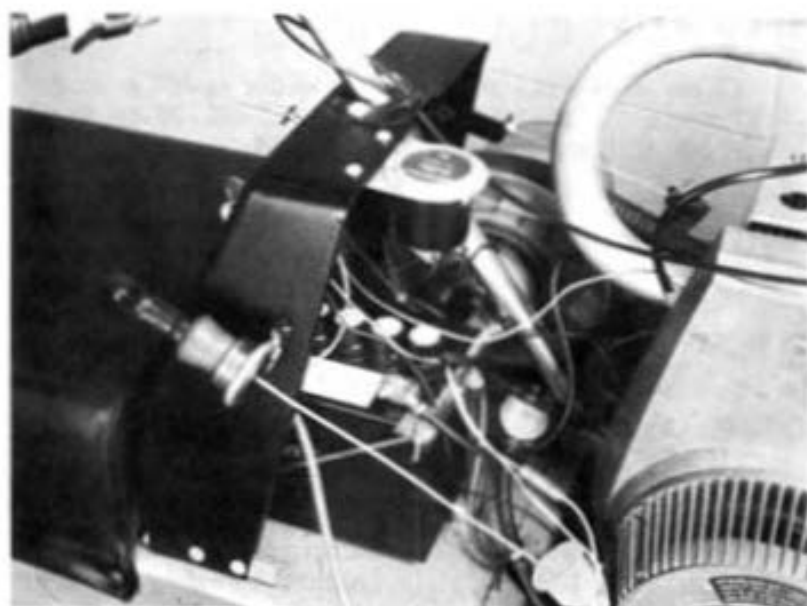


Fig. 24 - Electric Starting Kit and Hourmeter

ELECTRIC STARTING KIT

Permits easy starts in all weather. The standard recoil starter remains on the machine and may be used if the electric starter is not operative. See Fig. 24.

HOURLY METER

The hourmeter is usable only on machines equipped with electric start. Records hours in tenths. Exceptionally useful in determining fuel consumption and computing operating range.

TINTED WINDSHIELDS

Blue and amber tinted, non-glare windshields are available. Also available in a low profile version.

SPROCKETS

Chain sprockets to provide a wider speed selection -- 17 teeth for Models 300 S and 350 SS, 25-tooth for Model 500 SST and 21-tooth for all models.

SNOW FLAP

Snow Flap mounted on rear of machine, to protect passenger on Ski Whiz or those in pull-behind sleigh.

OTHER ACCESSORIES AND ATTACHMENTS INCLUDE

Gas cap with gauge, bulb-type primer, kick stand, in-shop dolly, speedometer, tachometer, compass, illuminated rear license plate holder, tote bag and rear view mirror.

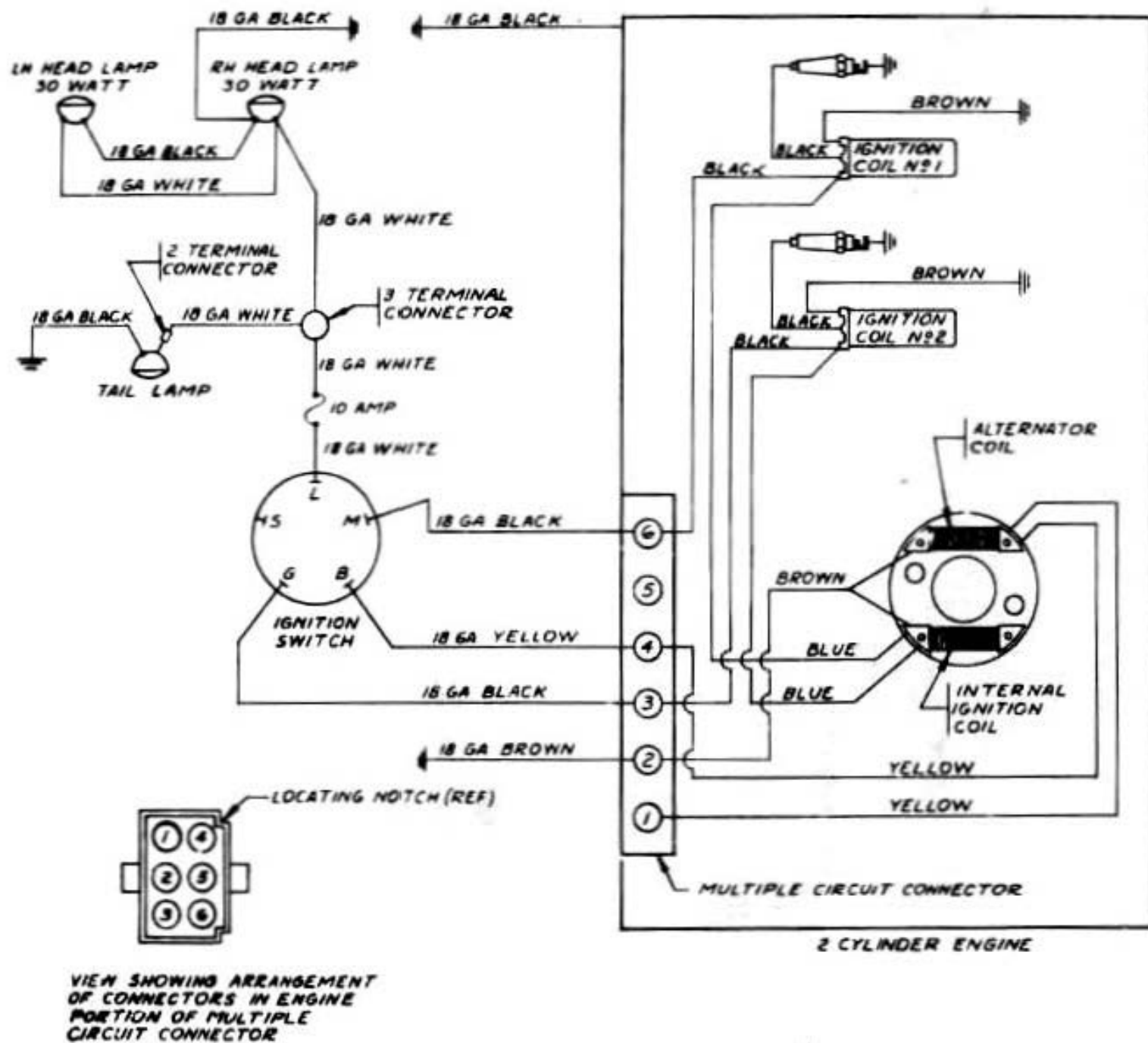


Fig. 26 - Schematic - Manual Start Wiring - Model 500 SST

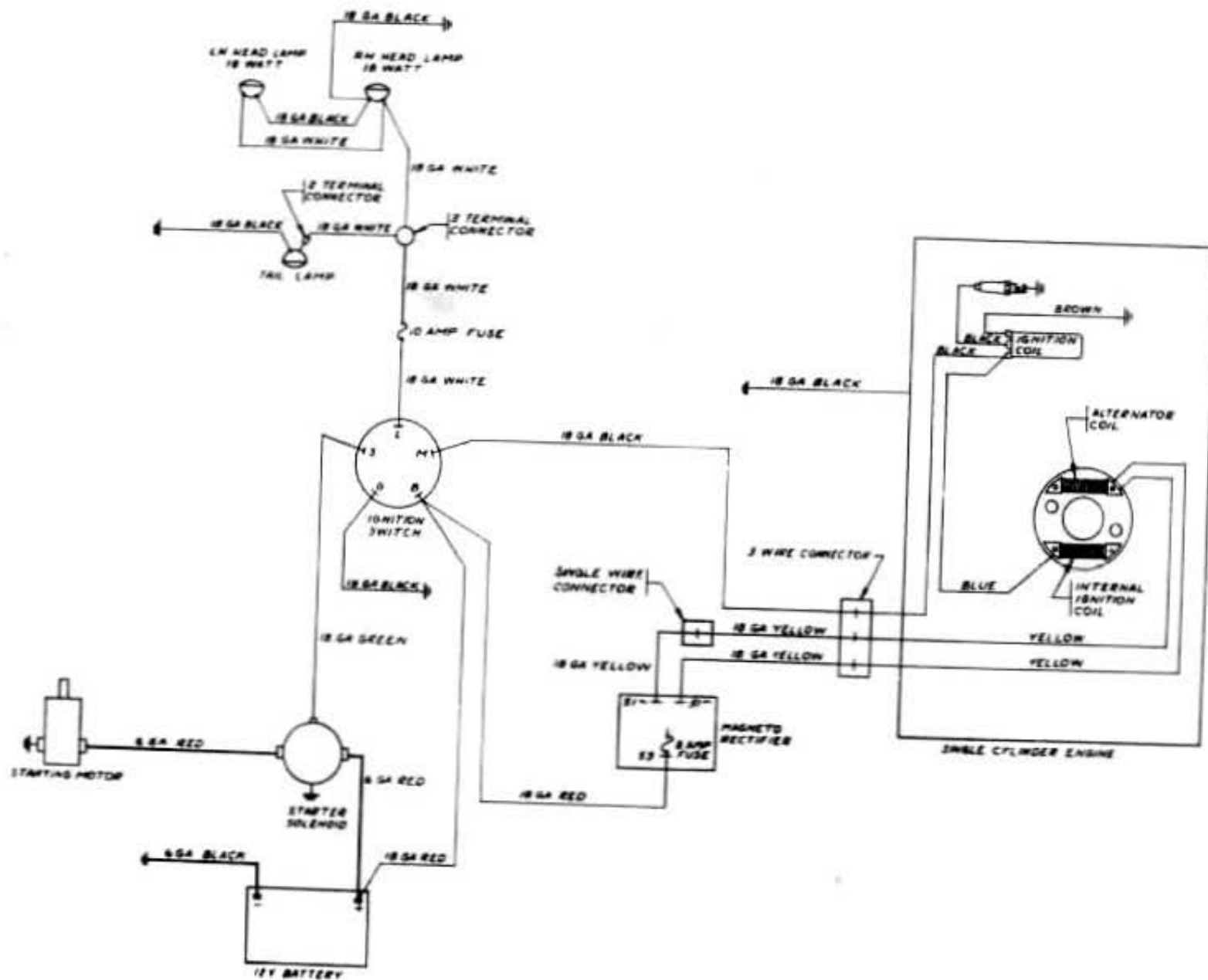


Fig. 27 - Schematic - Electric Start Wiring - Models 300 S, 350 SS

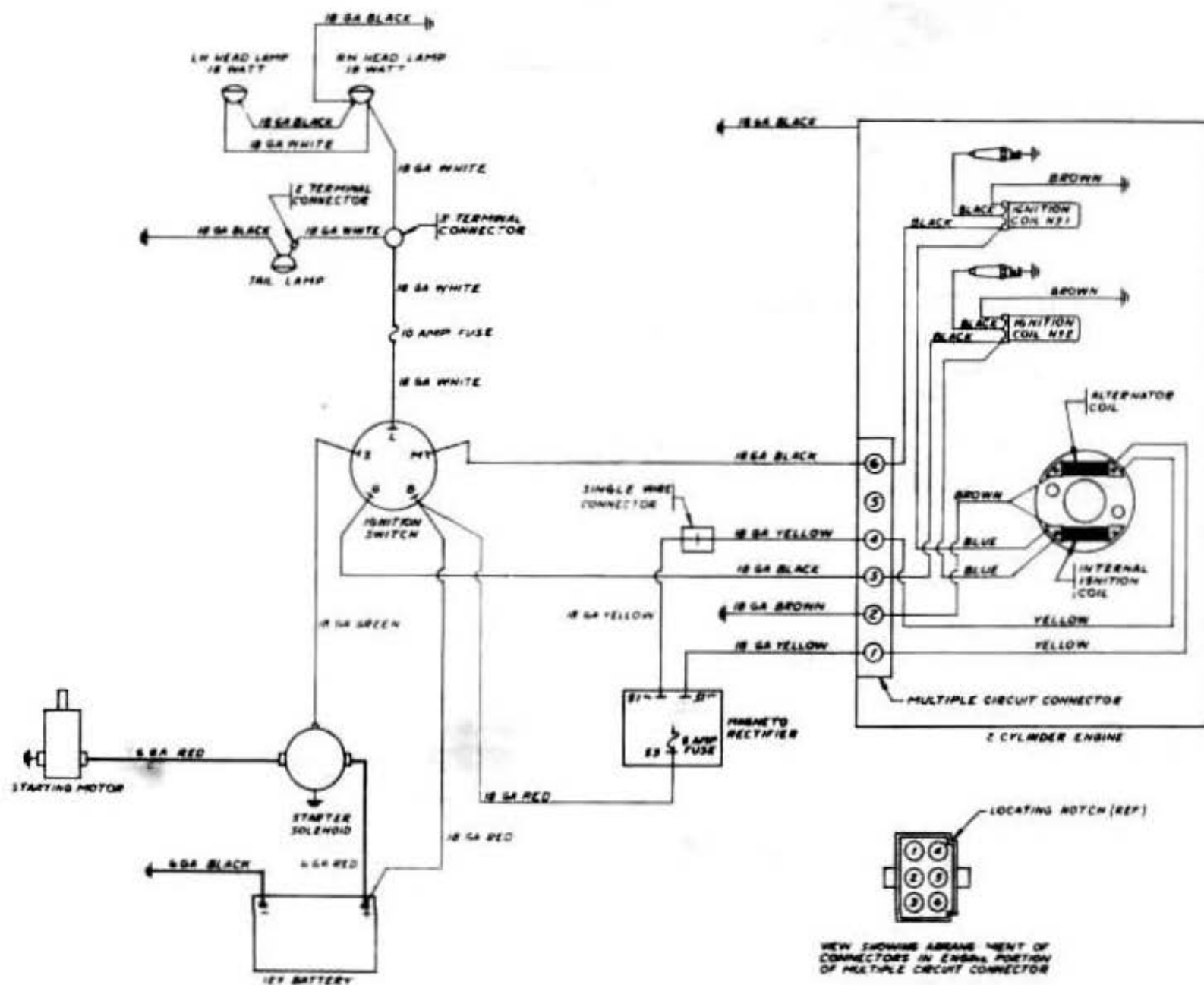


Fig. 28 - Schematic - Electric Start Wiring - Model 500 SST

SPECIFICATIONS

	<u>300 S</u>	<u>350 SS</u>	<u>500 SST</u>
TRACK	Molded Polyurethane		
Length on Ground	38"	44-1/2"	44-1/2"
Width	15-1/2"	15-1/2"	15-1/2"
Surface on Ground	589 Sq. In.	690 sq. in.	690 sq. in.
SKIS:			
Length	41-1/2"	41-1/2"	41-1/2"
Width	5"	5"	5"
OVERALL DIMENSIONS:			
Height (Over Windshield)	41"	42"	42"
Length	99-1/2"	106"	106"
Width	32"	32"	32"
DRIVE	Torque Sensitive		
BRAKE	Caliper Type		
ENGINES	1 cylinder	1 cylinder	Twin cylinder
	2 cycle	2 cycle	2 cycle
Size	JLO 292 cc	JLO 336 cc	JLO 443.8 cc
HP at 5500 rpm Mfgr's Rating	18.5	22	29
FUEL TANK CAPACITY	4 gals.	5-1/4 gals.	5-1/4 gals.
SEAT:			
Capacity	2 persons	2-3 persons	2-3 persons
Length	35"	39-1/2"	39-1/2"

	<u>300S</u>	<u>350 SS</u>	<u>500 SST</u>
SEAT: (Continued)			
Width	17"	17"	17"
WEIGHT (Approx.)	325 lbs.	355 lbs.	395 lbs.

The machines used for photographs in this Manual are prototypes and may differ slightly from production models.